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Construction Waste Management

According to a recent EPA study, construction and demolition (C&D) waste totaled more than 135 million tons (122.5 million tonnes) in the U.S. in 1998; about 77 million tons (69.9 million tonnes) resulted from commercial work alone. Per-square-foot waste generation ranges from about 4 pounds (19.5 kg/m²) for new construction and renovation to about 155 pounds (757 kg/m²) for building demolition. On many construction projects, recyclable materials such as wood, concrete and masonry, metals, and drywall make up as much as 75% of the total waste stream, presenting opportunities for significant waste diversion. As more C&D landfills reach capacity, new ones become increasingly difficult to site, and as more municipal waste landfills exclude C&D waste, tipping fees will continue to rise. Construction waste—and costs—can be managed just like any other part of the construction process, with positive environmental impacts on land and water resources.

Opportunities

C&D waste management takes advantage of opportunities for source reduction, materials reuse, and waste recycling. Source reduction is most relevant to new construction and large renovation projects and involves reduced “waste factors” on materials ordering, tighter contract language assigning waste management responsibilities among trade contractors, and value-engineering of building design and components. During renovation and demolition, building components that still have functional value can be reemployed on the current project, stored for use on a future project, or sold on the ever-growing salvage market. And recycling of building materials can be accomplished whenever sufficient quantities can be collected and markets are readily available.

**AVERAGE COMPOSITION OF WASTE FROM
19 INDUSTRIAL/COMMERCIAL DEMOLITION
PROJECTS IN THE NORTHWEST AREA**

Type of Material	Totals Tons	Average Percent
Wood	28,000	15.5
Roofing	1,400	0.8
Concrete	120,300	66.8
Brick	2,200	1.2
Scrap Iron	8,700	4.8
Asphalt	3,200	1.8
Landfill Debris	16,400	9.1
Total Tons	180,200	100.0
Total Tons (17 buildings) *	167,200	
Building Size (square feet) *	2,204,000	
Average generation rate *	151.7 lb/sq ft	
* Building sizes available for 17 of the 19 projects.		

Source: R.W. Rhine Inc., Tacoma, WA;
adapted from Table A-18 in
*Characterization of Building-
Related Construction and
Demolition Debris in the United
States* (EPA530-R-98-010)

Technical Information

Some key elements of C&D waste management include the following:

- **Waste assessment:** On any project, knowing ahead of time what type and quantity of materials will be generated can make lining up reduction, reuse, and recycling easier. Conduct your own audit or refer to existing audits (see Reference 1).
- **Contract language:** If all your trade contracts explicitly address waste management, contractors will know from the start how to handle your requirements for reuse and recycling (see Reference 2).
- **“Take-back” policies:** From acoustic ceiling tiles and cardboard packaging to carpeting and clean cut-off drywall, manufacturers’ systems for accepting suitable materials back into production are growing. Check with distributors and manufacturers about this before your project begins.
- **On-site recycling:** Recent research has added clean wood and drywall cut-off waste to concrete and masonry as waste materials suitable for grinding and use on the job site. Wood chips can be used for erosion control or mulch, and ground drywall as a soil amendment (see Reference 3).
- **Recycling systems:** Job-site recycling can be set up for commingled recovery (all waste goes into one container for processing), source separation (separate labeled bins for each recycled material and one for waste) or staged pickup (recycler times the pickup according to stage of construction to keep materials separated for recovery) (see Reference 4). Investigate options available in your area before your project begins.
- **Hazardous materials:** First, minimize hazmat generation by specifying nontoxic materials, particularly with the finishing (paints, stains, and coatings), plumbing (adhesives), and foundation (form-releasing agents) trades. Second, make sure that trade contractors identify all the hazardous materials they generate and document their plans for safe and compliant disposal.
- **Local resources:** Many local offices of solid waste or recycling have developed resources (handbooks, directories, Web sites) for C&D waste recovery. Contact local and state offices for local resources, including outlets, contractors, and related businesses.



Photo: Benchmark Contractors, Inc.

Good signage is critical to effective on-site source separation for C&D waste recovery.

References

Characterization of Building-Related Construction and Demolition Debris in the United States, EPA530-R-98-010 (see Tables A-11 through A-18), June 1998. Prepared for EPA by Franklin Associates.

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Yost, Peter, and Eric Lund, *On-site Grinding of Residential Construction Debris: The Indiana Grinder Pilot*, NAHB Research Center, Upper Marlboro, MD, July 1999.

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Contacts

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